CIMA

Financial Management Pillar

Strategic Level Paper

P9 – Management Accounting Financial Strategy

25 May 2005 – Wednesday Morning Session

Instructions to candidates

You are allowed three hours to answer this question paper.

You are allowed 20 minutes reading time **before the examination begins** during which you should read the question paper and, if you wish, make annotations on the question paper. However, you will **not** be allowed, **under any circumstances**, to open the answer book and start writing or use your calculator during this reading time.

You are strongly advised to carefully read the question requirement before attempting the question concerned. The question requirements are contained in a dotted box.

Answer the ONE compulsory question in Section A on pages 2 to 5. The question requirements are on page 5, which is detachable for ease of reference.

Answer TWO of the four questions in Section B on pages 8 to 15.

Maths Tables and Formulae are provided on pages 17 to 21. These are detachable for ease of reference.

Write your full examination number, paper number and the examination subject title in the spaces provided on the front of the examination answer book. Also write your contact ID and name in the space provided in the right hand margin and seal to close.

Tick the appropriate boxes on the front of the answer book to indicate which questions you have answered.

Financial Strategy

TURN OVER

SECTION A - 50 MARKS

[the indicative time for answering this Section is 90 minutes]

READ THE SCENARIO AND ANSWER THIS QUESTION. THE QUESTION REQUIREMENTS ARE ON PAGE 5, WHICH IS DETACHABLE FOR EASE OF REFERENCE

Question One

Scenario

Business background – The Groots Group

The Groots Group (Groots) is a retailer of clothing for women and children. The group started as a single store in France in the early 1900s. The business grew by acquisition of new premises and, occasionally, by buying out small competitors. Expansion outside France started in 1955 and the group now has stores in most European cities. The parent company obtained a listing in 1968, although at that time the founding family still owned the majority of the shares. It is no longer controlled by the family although the grandson of the founder is a board member and owns 2% of the share capital. The company's other directors and senior managers own a further 8% between them.

The style of clothing sold in the Group's stores has changed over the years and its main theme now might be described as "ethnic". Most of its goods are manufactured outside Europe, predominantly in India and other parts of Asia.

Corporate objectives

Groots has two financial objectives and one non-financial objective. These are:

- to increase earnings and dividends per share year on year by 5% per annum;
- to maintain an optimal debt/equity ratio within the range 25-30%;
- to adhere to ethical trading policies and recognise the interests of our various stakeholder groups in all our business activities.

Proposed acquisition

The directors of Groots believe they have exhausted possibilities for further expansion in Europe unless they are to diversify into different products such as men's clothing or household goods. They have, therefore, been reviewing opportunities for investment further afield for the past year. They have identified a small group of clothing stores trading in the East Caribbean and parts of South America, Cocomos Limited (Cocomos).

Cocomos is a listed company whose shares trade on an East Caribbean Stock Exchange. It has 18 stores as outlets for its products. Twelve of them are operated by the company itself and six are operated by franchisees. The clothing is at the expensive end of the market and aimed mainly at tourists.

Cocomos has followed a policy of buying locally-made clothing from within the Caribbean, Cuba or Puerto Rico, mainly from small co-operative-type manufacturers. The advantage of this policy is that the cost base is low, allowing for a substantial mark-up to retail. The disadvantage is that the quality is variable. If the acquisition proceeds, Groots would aim to review the product sources to improve the quality and expand the range. One alternative would be to supply the stores from sources in India, which already supply some of the European stores.

The directors of Cocomos and their families own 51% of the shares. A further 15% of the shares are owned by a local pension fund. The remaining 34% are owned by a number of wealthy individual investors, including a few who live most of the time in Europe or Canada.

Cocomos' directors are believed to be interested in opening discussions about a bid from Groots, but the franchisees are likely to be hostile. Although the franchisees are not shareholders, they will use the "stealing our national assets" argument to agitate the press, local politicians and, ultimately, the local population.

On the basis of published accounts, industry information and discussions with Cocomos' directors, the Groots' directors have forecast the following post-tax cash flows for Cocomos:

Year	1	2	3	4
Net cash flows (C\$millions)	31.5	37.5	41.5	47·2

Post-tax cash flows beyond year 4 are estimated to grow at 2% per annum.

The cash flows are in real terms; that is they do not include inflation. Groots evaluates all its domestic investment decisions at a nominal, post-tax discount rate of 10%. Cocomos' directors estimate their company's cost of capital as 12%. However, Groots' directors think this rate of 12% does not adequately reflect the risk of Cocomos' cash flows.

Summary of financial statements of bidder and target companies

<i>Income statement for the year ended 31 March 2005</i>	Groots Group €millions	Cocomos Limited Caribbean \$millions	
Revenue	1,051.5	215.8	
Operating profit	241.5	63.6	
Finance costs (including overdraft interest)	48.0	15.0	
Profit before tax	193.5	48.6	
Taxation	46.9	11.5	
Balance sheet as at 31 March 2005 Assets			
Property, plant and equipment	895.0	245.0	
Current assets			
Trade receivables and inventories	275.0	88.0	
Cash and cash equivalents	<u>45·0</u>	<u>12·0</u>	
Total assets	<u>1,215·0</u>	<u>345·0</u>	
<i>Equity and liabilities</i> Equity			
Share capital (Nominal value of €1 and C\$1 respectively)	245.0	55.0	
Retained earnings	290.0	100.0	
Total equity	535.0	155.0	
Non-current liabilities			
Secured loan stock 7% repayable 2012 Secured loan stock 10% repayable 2008	475.0	135.0	
Current liabilities			
Trade and other payables	<u>205.0</u>	<u>55.0</u>	
Total liabilities	<u>680·0</u>	<u>190·0</u>	
Total equity and liabilities	<u>1,215·0</u>	<u>345·0</u>	
Other financial information	€	C\$	
Share price today	6.85	6.95	
Shares last traded on	19 May 2005	31 January 2005	
High-Low share prices in past 12 months	9.25-6.25	7.50-5.50	
Debt value (market) per €100	105.50	n/a	
Debt last traded on	30 December 2004	n/a	

Question One continues on page 5

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Question One (continued)

Notes:

Exchange rate \in/C , interest and inflation rates The spot exchange rate is 0.30 (C\$1 = \in 0.30). Forecast economic data relevant to the Caribbean, the US and the European Common Currency Area (ECCA) are as follows:

	ECCA	Caribbean
Risk-free interest rate per annum	3.5%	6.5%
Inflation rate per annum	2.5%	4.5%

You should assume the theory of interest rate parity applies when forecasting exchange rates.

Taxation

Both companies will pay tax at an average of 25% from next year for the foreseeable future. Assume a double taxation treaty is in existence between France and the Caribbean country.

Debt agreement

There is a clause in Cocomos' debt agreement that says the whole of the C\$135 million debt is repayable immediately in the event of a successful takeover bid.

Requ	Required:		
(a)			
(i)	Calculate the maximum price that Groots would be prepared to pay for Cocomos based on the present value in euros of the forecast cash flows. Using appropriate discount rates, you should calculate present value using both the recognised methods of evaluating international investments.		
	(7 marks)		
(ii)	Comment briefly on why, in theory, these two methods should give the same answer and why, in practice, the answers might be different.		
	(3 marks)		
(iii)	Calculate the number of shares Groots might need to issue if it offers its own shares in exchange for Cocomos using the higher of the values for the company you have calculated in (i). Comment briefly on your calculations and/or assumptions.		
 	(4 marks)		
	(Total for Part (a) = 14 Marks)		
(b)	Assume you are a financial manager with Groots. Write a report to the directors of Groots which should include the following:		
(i)	A recommendation of the maximum price to be offered to Cocomos. You should base your recommendation on the figures you calculated in part (a) and other suitable methods of company valuation.		
(ii)	Identify and discuss alternative methods of financing the acquisition and make a recommendation of the most appropriate method in the situation here.		
(iii)	An analysis of strategies for enhancing the value of the combined company		
(iv)	Advice on the benefits and limitations of a post-completion audit and review in the context of the acquisition.		
	Use additional calculations to support your arguments, wherever relevant and appropriate, for which up to 10 marks are available. Marks are distributed roughly equally between sections of the report.		
	(Total for Part (b) = 36 Marks)		
	(Total for Question One = 50 Marks)		

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Section B starts on the next page

TURN OVER

SECTION B – 50 MARKS [the indicative time for answering this Section is 90 minutes] ANSWER *TWO* ONLY OF THE FOUR QUESTIONS

Question Two

XTA plc is the parent company of a transport and distribution group based in the United Kingdom (UK). The group owns and operates a network of distribution centres and a fleet of trucks (large delivery vehicles) in the UK. It is currently planning to expand into Continental Europe, operating through a new subsidiary company in Germany. The subsidiary will purchase distribution centres in Germany and invest in a new fleet of trucks to be based at those centres. The German subsidiary will be operationally independent of the UK parent.

Alternative proposals have been put forward by Messrs A, B and C, Board members of XTA plc on how best to structure the financing of the new German operation as follows:

- Mr A: "I would feel much more comfortable if we were to *borrow in our base currency*, *sterling*, where we already have long-standing banking relationships and a good reputation in the capital markets. Surely it would be much more complicated for us to borrow in euros?"
- Mr B: "I am concerned about the exposure of our consolidated balance sheet and investor ratios to sterling/euro exchange rate movements. How will we be able to explain large fluctuations to our shareholders? If we were to raise *long-term euro borrowings*, wouldn't this avoid exchange rate risk altogether? We would also benefit from euro interest rates which have been historically lower than sterling rates."
- Mr C: "We know from our market research that we will be facing stiff competition in Germany from local distribution companies. This is a high-risk project with a lot of capital at stake and we should finance this new venture by XTA plc raising *new equity finance* to reflect this high risk."

Assume that today is Saturday 1 October 2005. A summary of the latest forecast consolidated balance sheet for the XTA Group at 31 December 2005 is given below. It has been prepared BEFORE taking into account the proposed German investment:

	£M
Assets	
Total assets	<u>450</u>
Equity and liabilities	
Equity	250
Long-term borrowings	150
(there were no other non-current liabilities)	
Current liabilities	<u>50</u>
Total equity and liabilities	<u>450</u>

The proposed investment in Germany is scheduled for the final quarter of 2005 at a cost of £60m for the distribution centres and £20m for the fleet of trucks when translated from euros at today's exchange rate of £1 = €1.50. There is a possibility that the euro could weaken against sterling to £1 = €2.00 by 31 December 2005, but it can be assumed that this will not occur until after the investment has been made. The subsidiary's balance sheet at 31 December 2005 will only contain the new distribution centres and fleet of trucks matched by an equal equity investment by XTA plc and will only become operationally active from 1 January 2006.

Req	uired:
(a)	Write a memorandum to the Board of XTA plc to explain the advantages and disadvantages of using each of the following sources of finance:
	 a rights issue versus a placing (assuming UK equity finance is chosen to fund the new German subsidiary); and
	 a euro bank loan versus a euro-denominated eurobond (assuming euro borrowings are chosen)
	(8 Marks)
(b)	Evaluate EACH of the alternative proposals of Messrs A, B and C for financing the new German subsidiary and recommend the most appropriate form of financing for the group. Support your discussion of each proposal with
	 a summary forecast consolidated balance sheet for the XTA group at 31 December 2005 incorporating the new investment; and
	 calculations of gearing using book values
	using year end exchange rates of both $\pounds 1 = \pounds 1.50$ and $\pounds 1 = \pounds 2.00$. (17 Marks)
	(Total for Question Two = 25 Marks)

Section B continues on the next page

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Question Three

GSD Ltd is a private UK company owned by the two families that started the business in 2000. The company produces organic food products for distribution in the domestic UK market using food products from UK farms. The company is experiencing a period of rapid growth, with revenue expected to rise by 15% in each of the following five years.

The company is hoping to retain a profit margin (profit before interest and taxes divided by revenue) of 30% throughout the next five years. The ratio of working capital to revenue is expected to remain constant, where working capital is inventories plus trade receivables less trade payables.

Interest is paid on the overdraft and bank loan at 6% per annum. Interest on the bank loan and overdraft is calculated on the balance outstanding at the beginning of the year. Corporation tax is paid one year in arrears at a rate of 30%, with a 100% tax allowance for capital expenditure in the year in which it is incurred. In arriving at operating profit, depreciation is charged at 25% on a reducing balance basis based on year-end balances.

Extracts from the management accounts of GSD Ltd on 31 December 2004 are as follows:

Balance sheet as at 31 December 2004	£m
Property, plant and equipment	15
Working capital	9
	<u>24</u>
Share capital (50p ordinary)	10
Retained earnings	4
Long-term borrowings (bank loan)	8
Short-term borrowings (overdraft)	1
Current tax payable	_1
	<u>24</u>
Income statement for the year ended 31 De	ecember 2004
Revenue	45.0

Revenue	45.0
Profit before interest and taxes	13·5
Dividend paid in 2004	50p a share

Capital expenditure plans are for expenditure on property, plant and equipment of £10m in 2005, £10m in 2006 and £7m in each of years 2007 to 2009. No disposals of property, plant and equipment are expected in this period.

Shareholders expect a year-on-year increase in dividends of 5%. Any funds deficit in the year will be funded by overdraft and any surplus funds used to reduce the overdraft. However, with the increased demands on the funds of the business to finance growth, the directors are concerned that they may exceed the overdraft limit of £1.5m. They may, therefore, need to negotiate an increase in the bank loan, although the bank has indicated that it would not accept gearing higher than 70% based on book values where gearing is defined as long and short term borrowings (including overdraft) divided by equity. The shareholders have indicated that they do not wish to inject any additional capital into the business.

r – – – – ¦ Req	uired:
(a)	Construct the balance sheet, income statement and a cash flow analysis of the company for each of the years 2005 and 2006 and advise the company on the extent of any additional funding requirement in that period. In your answer, round figures to the nearest £100,000.
 	(16 Marks)
(b)	Discuss the interrelationships between financing, investment and dividend strategies with reference to the liquidity requirements of GSD Ltd. Include in your discussion how each could be adapted to meet the company's liquidity requirements in the years 2005 and 2006 and provide a recommendation. <i>(9 Marks)</i>
	(Total for Question Three = 25 Marks)
 	(7 marks) (Total for Question Three = 25 Marks)

Section B continues on the next page

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Question Four

FLG Inc is an airline operator based in the United States, operating a wide network of both domestic and international flights. It has recently obtained a new licence to operate direct flights to a new European destination which will necessitate the acquisition of four identical second-hand aeroplanes at a total cost of \$100 million. The aeroplanes are expected to be in service for five years and each one is expected to have a residual value of \$12.5 million at the end of the five years. However, the residual value is highly dependent on the state of the airline industry at the end of the five-year period and there is a risk that the residual value could be much lower if there is a general reduction in air travel at that time.

The company has been offered a lease contract with total lease payments of \$15 million per annum for five years, payable in advance, with all maintenance costs being borne by the lessee.

Alternatively, the aeroplanes could be purchased outright and the bank has offered the company a five-year loan with variable interest payments payable semi-annually six months in arrears at a margin of 1% per annum above a reference six-month \$ inter-bank rate. The reference six-month \$ inter-bank rate is forecast to be at a flat rate of 2.4% for each six-month period, for the duration of the loan.

The company pays tax at 30% and expects to make taxable profits in excess of the lease payments, interest charges and tax depreciation allowances arising over the next five years. Tax depreciation on the purchase of the aeroplanes can be claimed at a rate of 20% at the end of each financial year on a written-down value basis, with a delay of one year between the tax depreciation allowance arising and the deduction from tax paid.

Req	uired	
(a)	Calc	ulate:
	(i)	the compound annualised post-tax cost of debt;
	(ii)	the NPV of the lease versus purchase decision at discount rates of both 4% and 5%;
	(iii)	the breakeven post-tax cost of debt at which FLG Inc is indifferent between leasing and purchasing the aeroplanes.
		(10 Marks)
(b)	Reco the a	ommend, with reasons, whether FLG Inc should purchase with a loan or lease aeroplanes.
	Your versi	answer should include appropriate calculations of the sensitivity of the lease us purchase decision to changes in EACH of the following:
	• th	ne reference \$ inter-bank rate for the duration of the loan;
	• th	ne residual value of the aeroplanes.
		(15 Marks)
		(Total for Question Four = 25 Marks)

Section B continues on the next page

TURN OVER

Question Five

CTC Technology College (CTC) is a non-profit making institution located in Ireland, where the national currency is the euro. The college is funded by a combination of student fees and government grants.

The number of students enrolled on the part-time Information Technology course at CTC has fallen over recent years due to competition from other colleges and the wide range of different courses available. The number of students enrolling on the current course, ITS (IT Skills) has stabilised at around 150 students per annum and there are currently 20 computers surplus to requirements which CTC plans to sell for an estimated \in 100 each; the current book value of each computer is \in 200. However, this sale will not occur if the college goes ahead with its plan to replace the current ITS course with an updated course, as it is expected that a new course would result in a significant increase in student numbers.

CTC realises that the financial viability of switching courses is highly dependent on the number of students that the college can attract onto the new course and has commissioned some market research, at a cost of €10,000, into the best course content and likely increase in student numbers. The results of this research indicate that an ITC (IT Competence) course would be the most popular and lead to a significant increase in student enrolments at the college. It is also estimated that there could be an additional benefit to the college of average net revenues of €20 per additional student over and above 150 as a result of those students being attracted to the college and taking other courses at the college at the same time as the ITC course.

The new ITC course would be run by existing staff currently working on the ITS course at a cost of \leq 50,000 per annum. If, however, the numbers of students on ITC were to rise above 200 per annum, an additional part-time member of staff would be needed at a cost of \leq 10,000 per annum, payable in advance. If ITC is adopted, several computers would need to be upgraded at a total one-off cost of \leq 15,000.

Other relevant data is as follows:	ITS €	ITC €
Fee for the course (per student, payable in advance)	350	360
Directly attributable course costs (per annum, payable in arrears)	1,000	2,000
Books and consumables per student, payable in advance	50	60
Apportionment of college overheads (excluding staff costs) (per annum, charged at the end of the year)	20,000	25,000
Staff training and course development (initial set-up cost)	0	30,000

The planning horizon for the college is four years and projects are evaluated using a discount rate of 8% and on the basis of a zero terminal value at the end of the four-year period. Each course is of one year duration and student enrolments should be assumed to remain constant throughout the four-year period, with ITS attracting 150 students each year.

Taxation and inflation should be ignored.

Req	luirea	1:
(a)	Eval for it colle	luate the number of student enrolments required on the ITC course in order t to be financially beneficial, on a net present value of cash flow basis, for the ege to replace the ITS course with the ITC course. (15 Marks)
(b)	Advi	ise the governing body of the college on the following issues:
	(i)	How to monitor and control the costs and revenues of the project from the decision to introduce the new course to the start date of the course; (5 Marks)
	(ii)	Options available if only 150 students enrol on the new ITC course by the enrolment deadline two weeks before the beginning of the course by which time all other course preparations will have been completed. (5 Marks)
¦ ' '		(Total for Question Five = 25 Marks)

(Total for Section B = 50 Marks)

End of Question Paper

Maths Tables and Formulae are on pages 17 to 21

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MATHS TABLES AND FORMULAE

Present value table

Present value of 1.00 unit of currency, that is $(1 + r)^{-n}$ where r = interest rate; n = number of periods until payment or receipt.

Periods	Interest rates (r)									
(<i>n</i>)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods	Interest rates (r)									
(<i>n</i>)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.079	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

Cumulative present value of 1.00 unit of currency per annum, Receivable or Payable at the end of each year for *n* years $\left[\frac{1-(1+r)^{-n}}{r}\right]$

Periods	Interest rates (r)									
(<i>n</i>)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods	Interest rates (r)									
(<i>n</i>)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	7.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

FORMULAE

Valuation models

(i) Irredeemable preference share, paying a constant annual dividend, *d*, in perpetuity, where *P*₀ is the ex-div value:

 $P_0 = \frac{d}{k_{\text{pref}}}$

(ii) Ordinary (equity) share, paying a constant annual dividend, d, in perpetuity, where P_0 is the ex-div value:

 $P_0 = \frac{d}{k_e}$

(iii) Ordinary (equity) share, paying an annual dividend, d, growing in perpetuity at a constant rate, g, where P_0 is the ex-div value:

$$P_0 = \frac{d_1}{k_e - g}$$
 or $P_0 = \frac{d_0[1 + g]}{k_e - g}$

(iv) Irredeemable (undated) debt, paying annual after-tax interest, i [1 - t], in perpetuity, where P_0 is the ex-interest value:

$$P_0 = \frac{l[1-t]}{k_{\text{dnet}}}$$

 $P_0 = \frac{i}{k_{\rm d}}$

or, without tax:

(v) Total value of the geared firm, V_q (based on MM):

$$V_q = V_u + TB_c$$

(vi) Future value of S, of a sum X, invested for *n* periods, compounded at *r*% interest:

$$S = X[1 + r]^{n}$$

(vii) Present value of 1.00 payable or receivable in *n* years, discounted at *r*% per annum:

$$PV = \frac{1}{\left[1+r\right]^n}$$

(viii) Present value of an annuity of 1.00 per annum, receivable or payable for *n* years, commencing in one year, discounted at *r*% per annum:

$$PV = \frac{1}{r} \left[1 - \frac{1}{\left[1 + r\right]^n} \right]$$

(ix) Present value of 1.00 per annum, payable or receivable in perpetuity, commencing in one year, discounted at *r*% per annum:

$$PV = \frac{1}{r}$$

(x) Present value of 1.00 per annum, receivable or payable, commencing in one year, growing in perpetuity at a constant rate of g% per annum, discounted at r% per annum:

$$PV = \frac{1}{r-g}$$

FORMULAE CONTINUE ON THE NEXT PAGE

Cost of capital

(i) Cost of irredeemable preference capital, paying an annual dividend, d, in perpetuity, and having a current ex-div price P_0 :

$$k_{\text{pref}} = \frac{d}{P_0}$$

(ii) Cost of irredeemable debt capital, paying annual net interest, i [1 - t], and having a current ex-interest price P_0 :

$$k_{d \text{ net}} = \frac{i[1-t]}{P_o}$$

(iii) Cost of ordinary (equity) share capital, paying an annual dividend, *d*, in perpetuity, and having a current ex-div price *P*₀:

$$k_{\rm e} = \frac{d}{P_{\rm o}}$$

(iv) Cost of ordinary (equity) share capital, having a current ex-div price, P_0 , having just paid a dividend, d_0 , with the dividend growing in perpetuity by a constant g% per annum:

$$k_{e} = \frac{d_{1}}{P_{0}} + g$$
 or $k_{e} = \frac{d_{0}[1+g]}{P_{0}} + g$

(v) Cost of ordinary (equity) share capital, using the CAPM:

$$k_{\rm e} = R_f + [R_m - R_f] \beta$$

(vi) Cost of ordinary (equity) share capital in a geared firm (no tax):

$$k_{eg} = k_0 + [k_o - k_d] \frac{V_D}{V_E}$$

(vii) Cost of ordinary (equity) share capital in a geared firm (with tax):

$$k_{eg} = k_{eu} + [k_{eu} - k_d] \frac{V_D [1-t]}{V_E}$$

(viii) Weighted average cost of capital, k_0 :

$$k_0 = k_{eg} \left[\frac{V_E}{V_E + V_D} \right] + k_d \left[\frac{V_D}{V_E + V_D} \right]$$

(ix) Adjusted cost of capital (MM formula):

$$K_{adj} = k_{eu} [1 - tL]$$
 or $r^* = r[1 - T^*L]$

In the following formulae, β_u is used for an ungeared β and β_g is used for a geared β :

(x) β_u from β_g , taking β_d as zero (no tax):

$$\beta_{u} = \beta_{g} \left[\frac{V_{E}}{V_{E} + V_{D}} \right]$$

(xi) β_u from β_g , taking β_d as zero (with tax):

$$\beta_{u} = \beta_{g} \left[\frac{V_{E}}{V_{E} + V_{D} [1 - t]} \right]$$

(xii) Adjusted discount rate to use in international capital budgeting using interest rate parity:

1 + annual discountrate C\$	Exchange rate in 12 months' time C\$/Euro						
1 + annual discount rate Euro	Spot rate C\$/Euro						

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Other formulae

(i) Interest rate parity (international Fisher effect):

Forward rate US\$/£ = Spot US\$/£ x $\frac{1 + \text{nominal US interest rate}}{1 + \text{nominal UK interest rate}}$

(ii) Purchasing power parity (law of one price):

Forward rate US\$/£ = Spot US\$/£ x $\frac{1+US \text{ inflation rate}}{1+UK \text{ inflation rate}}$

(iii) Link between nominal (money) and real interest rates:

[1 + nominal (money) rate] = [1 + real interest rate][1 + inflation rate]

(iv) Equivalent annual cost:

Equivalent annual cost = $\frac{PV \text{ of costs over } n \text{ years}}{n \text{ year annuity factor}}$

(v) Theoretical ex-rights price:

TERP =
$$\frac{1}{N+1}$$
 [(N x cum rights price) + issue price]

(vi) Value of a right:

Value of a right = $\frac{\text{Rights on price} - \text{issue price}}{N+1}$

or

Theoretical ex rights price - issue price

Ν

where N = number of rights required to buy one share.

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Financial Management Pillar

Strategic Level

P9 – Management Accounting Financial Strategy

May 2005

Wednesday Morning Session

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